

Invasion of Rugose Spiralling Whitefly in West Bengal

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Introduction

Rugose spiralling whitefly, *Aleurodicus rugioperculatus* Martin (Hemiptera: Aleurodidae) is an invasive, highly polyphagous pest on coconut reported from Tamil Nadu during August 2016 for the first time in India as well as Oriental region (Selvaraj *et al.*, 2016; Sundararaj and Selvaraj, 2017). Subsequently, the pest was reported from different parts of Kerala, coastal districts of Karnataka, East Godavari, West Godavari, Vizayanaram districts of Andhra Pradesh and Goa during 2017 on coconut, banana, sapota, maize, oil palm, mango, cashew and many other ornamental plants (Selvaraj *et al.*, 2017; Selvaraj *et al.*, 2018 & 2019). Pest occurrence was confirmed in Kamrup and Nalbari districts of Assam during 2018 (Chandrika Mohan *et al.*, 2018). Recently, its occurrence was noticed in Purba Midnapur and Howrah districts of West Bengal during April 2019 on coconut (*Cocos nucifera*), banana (*Musa spp.*), mango (*Mangifera indica*), sapota (*Manilkara zapota*), Hibiscus (*Hibiscus rosa-sinensis*), guava (*Psidium guajava*), citrus (*Citrus spp.*), water apple (*Syzygium samarangense*), jamun (*Syzygium cumini*), ficus (*Ficus bengalensis*), custard apple (*Annona spp.*), jack fruit (*Artocarpus heterophyllus*), areca nut (*Areca catechu*), betel vine (*Piper betle*), spanish cherry (*Mimusops elengi*), akashmoni (*Acacia auriculiformis*) and areca palm (*Dysoxylum sp.*). This is the first report of this pest from West Bengal. This paper describes, its distribution, severity, host range, natural enemies and impact on coconut cultivation in India. In India, the pest found to feed on 35 host plants across the field, horticultural, plantation

and ornamental plants. The pest is believed to be originated from Central America and could be introduced to India accidentally from Florida, USA through ornamental plants trade from the region.

Two days extensive survey was carried out in affected areas along with Mr. Pradip Mazumdar, Advisor, Agriculture to Chief Minister of West Bengal and officials from department of agriculture. Pest was probably introduced to Purba Midnapur and Howrah district through transport of plant materials from infested areas either from Orissa or South India. Pest could be introduced before three to four months before as its severity reached alarming situation especially on coconut, banana and betelvine and the infestation was up to 60-100% on this crop plant. Due to infestation of this, withering and drying of leaves in coconut and banana, consumer preference and marketing of betel vine was reduced drastically because of the sooty mold on the upper surface of leaves. About 200 ha has been severely affected due to this invasive whitefly in West Bengal. Prevailing hot and humid weather conditions, availability of wide range of suitable plants and absence of natural enemies might have favoured pest multiplication and spread. Survey also revealed the absence of proven potential natural enemies i.e. Encasiaguadelouape (*Hymenoptera: Aphelinidae*) which indicates the pest introduced without its natural enemies complex. However, chrysopid, *Dichochrysa astour* (*Neuroptera: Chrysopidae*) only natural enemies was noticed during survey. In South India, natural parasitism by *E. guadeloupa* recorded to the extent of 60 to 82% on coconut and other crops was observed and it was

well established by augmentation by re-distribution and various conservation strategies (Selvaraj *et al.*, 2016).

Awareness programme

To create awareness about this invasive pest, sensitization cum awareness programme was organized by ICAR-NBAIR in collaboration with department of Agriculture, Government of West Bengal. About 80 department officials and progressive farmers participated in the programme. The technical lecture on Biosuppression of invasive rugose spiralling whitefly was delivered by Dr. K. Selvaraj and suggested were invasion of pest, identification, host plant ranges, distribution and natural enemy's complex. Beside this, special emphasis on biological control by *Encarsia guadeloupa* and its augmentation and conservation strategies for effective management of pest was also discussed. Other suitable management strategies like foliar application of neem oil @ 1% and entomopathogenic fungus, *Isaria fumosorosea* Wize (*Deuteromycotina: Hyphomycetes*) (formerly *Paecilomyces fumosoroseus*) at 1x10⁶ spores/ml were also suggested. Farmers also highlighted successful management of pest in South India in different locations by various stakeholders through various programmes. Extension folder on biological control of invasive rugose spiralling whitefly was distributed among farmers and department officials.

Distribution of *Encarsia guadeloupa* and *Isaria fumosorosea*

Nucleus culture of *Encarsia guadeloupa* and *I. fumosorosea* was distributed among farmers for the management of the pest. Besides, farmers and department officials demonstrated the identification of *E. guadeloupa* adult population and parasitized nymphs at field level and release technique and conservation strategies including impact of pesticides on this natural enemy.

Integrated management strategies

1. Avoid transportation of coconut seedling or any other ornamental plants from pest infested areas.
2. Continuous monitoring on pest and natural parasitism in field on different host plants through yellow sticky traps.
3. Conserve /encourage natural buildup of *Encarsia guadeloupa* through providing reservoir plants/banker plants which protect them from pesticides and unfavorable weather factors.

4. Re-distribution of *E. guadeloupa* affected areas through "Field insectary technique" for augmentation natural enemies. Field collected parasitized materials were strategically placed in, on, or next to infested vegetation.

5. Pesticides holiday may be declared for the pest. Therefore, application of unwarranted insecticides may be avoided to enhance the natural parasitism.

6. Foliar application (Two sprays) of *Isaria fumosorosea* @ 2x 10⁸ spores/ml at 15 days intervals.

7. Release of *Chrysoperla zastrowi sillemi* / *Dichochrysa* sp. nr. *astur* @ 1000 eggs/ha at 15 days interval.

8. Under severe outbreak situation and absence of natural parasitism, neem oil 1% may be applied.

9. Awareness programme on the natural buildup of the parasitoid *E. guadeloupa* to be conducted in all epidemic zones to sensitize the farming community.

10. Community based approach warranted for the effective management of this invasive pest.

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